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ABSTRACT

Since statistics on television viewing and television ownership suggest that this medium is a pervasive and powerful influence on most people's lives, it is potentially informative to identify and study that relative handful of people who are not regularly exposed to television, identifying their defining characteristics. In contrast to previous studies, the present study attempts to characterize television nonveiwers by using multivariate analysis instead of two-way cross tabulations, and by including more predictor variables related to life style. A list of more than 200 variables was pared first to 43 and then to 11 by using discriminant analysis. The 11 variables succeeded in classifying television viewers and nonviewers correctly for 74.6% of the cases in one sample (from a national survey) and 66.4% of the cases in an entirely different sample two years later. The variables associate nonviewing with less satisfaction from family life, greater happiness in general, fewer children under age six in the household, greater participation in groups and organizations, more time spent in active military service, lower family income, stronger view of self as religious, greater numbers of teenagers in household, higher level of family income when person was 16, less frequent attendance at religious services, and more frequent socializing with friends outside the neighborhood. (RL)

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A Discriminant Analysis of Television Viewers and Nonviewers

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A Discriminant Analysis of Television Viewers and Nonviewers

The average television set is on 6.26 hours per day,[1] with the average person watching more than 3.4 hours per day.[2] Furthermore, 97.9% of the homes in the United States have television sets.[3] Television has been described as "the central cultural arm of American society,"[4] "an irresistible narcotic"[5] and "the modern communion."[6] If television is that pervasive and powerful in most people's lives, it might be important to identify and study that handful of people who are not regularly exposed to television. Who are these individuals outside the major cultural experience of today? Do they have any defining characteristics?

The few previous studies of these questions have produced mixed results. Westley and Mobius[7] studied the non-television household by analyzing a survey of 798 respondents in Madison, Wisconsin. The introductory note to their 1960 article described the non-television owner as "something of a rare bird, not necessarily needing sanctuary, but certainly worthy of study." These authors used two-way cross tabulations to compare the 86% of households with television with the 14% without television. They found television non-ownership was associated with lower income of the chief wage earner, fewer adults in the household, fewer children aged 5-15, fewer family organizational affiliations and affiliation with professional types of organizations rather than other types. There was a curvilinear relationship between television non-ownership and education of the chief wage earner, with greater non-ownership coming from people with either less than a high school education or education beyond college. Non-ownership was also related to occupation of the chief wage earner in a

complex way, with non-ownership being highest for professionals; clerical and sales workers; and unskilled, service and domestic workers.

Jackson-Beeck[8] studied the nonviewer of television by performing a secondary analysis of the National Opinion Research Center (NORC) 1975 General Social Survey. She defined the nonviewers of television to be those persons who reported viewing less than 30 minutes a day when asked, "On the average day, about how many hours do you personally watch television?" Of the 1490 respondents, 57 were thus classified as nonviewers. Jackson-Beeck also used two-way cross tabulations to investigate the relationships between the variable of viewing-nonviewing and a number of variables which were mostly standard demographics. The introductory note to Jackson-Beeck's article described nonviewers as "members of an endangered species without distinctive character although they differ from viewers in some specific ways." Her article ended with this conclusion:

> The most appropriate characterization of the television nonviewer thus appears to be none at all. Certainly, there are considerable differences between viewers and nonviewers on a number of specific variables. But in a larger, social sense, the data analyzed here do not support continued reference to nonviewers as if they were a meaningful population subgroup. Instead, nonviewers appear to be not only rare in United States today; from the macro perspective they seem to be socially insignificant.

The Westley and Mobius and Jackson-Beeck articles dealt with different facets of the nonviewing phenomenon: Westley and Mobius with television set ownership or non-ownership and Jackson-Beeck with television viewing or nonviewing. They may be dealing with the same group of people, however. The 57 nonviewers in the Jackson-Beeck study made up about 4% of the 1490 respondents to the 1975 NORC survey, and 4% was roughly the figure for non-ownership of television sets at that time.

A third related study by Edgar[9] focused on interviews with members of 298 Australian families who had rejected television. The article was devoted mostly to the verbatim opinions of these respondents concerning television, but Edgar did report some characteristics of the group as a whole. They were of a higher level of education than the average Australian. More than two-thirds of the men had professional jobs. They led active social lives, with more than 90% of the men and women belonging to one social club or society. Ninety-six per cent of the respondents claimed to have "a lot of books" in their home, and more than 40% were able to play a musical instrument. Most respondents said they felt television was a waste of time, that it made people lazier and more passive, and that it was addictive.

These studies provide some hints about who the television nonviewer is, but they do not furnish a clear picture. One limitation of all three studies is that they do not go beyond bivariate analysis. A multivariate analysis, with the capability of examining the operations of several variables simultaneously, might succeed in providing a more definite profile of the elusive television nonviewer.

In addition, these previous studies based their analyses to a large extent on demographic variables. Research by Plummer[10] and others has brought out the fruitfulness in audience research of going beyond flat demographic descriptions and attempting to look at "life style patterns" -- demographics along with a person's activities, interests and opinions.

The present study attempts to go further in characterizing the television nonviewer by using multivariate analysis instead of two-way cross tabulations and by including more predictor variables related to life style. Specifically, this study uses the multivariate analysis technique of discriminant analysis

to reanalyze the data from the 1975 NORC survey, the data already analyzed with cross tabulations by Jackson-Beeck.

Method

Discriminant analysis is a technique developed by Sir Ronald Fisher for classifying objects into two or more groups on the basis of their measurements on a number of variables. It was first used in certain problems of archaeology such as classifying a skull as either male or female on the basis of careful measurements of the jaw bone. Fisher's classic article introducing discriminant analysis dealt with classifying three species of iris, and showed that the three could be distinguished rather effectively on the basis of four measurements from each flower.[11] Since the time of Fisher, discriminant analysis has become a widely used technique in such areas as weather prediction, medical research and educational testing.[12] The application of discriminant analysis to audience research has been discussed by Massy.[13]

A discriminant analysis produces an equation from which a discriminant score can be computed for each object being classified. The right hand side of the equation consists of a string of predictor variables each with its own coefficient, much like a regression equation. In fact, a discriminant analysis for two groups can be thought of as a multiple regression analysis in which the dependent variable is a dummy variable with "0" and "1" as possible states indicating membership in the two groups.[14] A discriminant analysis determines the optimum coefficient for each predictor variable so that there will be the maximum separation between discriminant scores for the two (or more) groups. In the present study, the researchers attempted to develop a discriminant function that would classify people accurately as either television viewers or nonviewers.

The discriminant analysis was performed on a subsample from the 1975

NORC survey. This subsample consisted of all 57 nonviewers and 57 randomly selected television viewers. This subsample was selected to reduce the cost of data analysis and to create a situation in which each respondent had an equal probability of being classified a viewer or nonviewer. With the entire sample of 1490, the chances that any one respondent was a nonviewer were 57 out of 1490, or 4%. With the entire survey, one could classify respondents correctly 96% of the time by simply guessing that an unknown respondent was a viewer. The classification problem becomes more challenging and the discriminant function becomes more useful if the a priori probabilities are .50 for each group. This study used the same definitions of viewer and nonviewer that had been used by Jackson-Beeck. The nonviewers were those 57 persons who said they watched less than a half an hour of television on the average day and the 57 viewers were randomly selected from the 1426 respondents who said they watched half an hour or more (7 respondents gave no answer).

The NORC survey was based on hour-long interviews and obtained information on more than 200 variables. The discriminant analysis program to be used could only handle up to 100 variables, so the list of 200 variables was pared down for the first analysis. Some variables were screened out for being less theoretically relevant to viewing-nonviewing. These included attitudes about certain foreign nations, attitudes about pornography laws and detailed information about occupational activities. A particular effort was made to include variables left out by Jackson-Beeck but which might be related to television nonviewing. Examples of these variables are numbers of groups and organizations belonged to and frequency of spending social evenings with friends.

Also dichotomous variables had to be excluded from analysis because the survey had some missing data on almost every variable, and there appears

to be no good solution to the problem of missing values in a discriminant analysis when you have dichotomous variables.

Taking out the less theoretically relevant variables and the dichotomous variables left 43 variables, each of which was at least an ordinal scale with three or more possible values. For this set of variables, a missing value was replaced with the mean for that variable computed from the remaining cases in the subsample of 114. The literature contains descriptions of more complicated procedures for dealing with missing data in a discriminant analysis, but substituting the mean seems to be a generally acceptable procedure.[15]

The data were analyzed with the SPSS Discriminant Analysis program.[16] A stepwise discriminant analysis was performed and the option which would minimize Wilks' lambda was chosen.

Results

The discriminant analysis was conducted first on the set of 43 selected variables. The analysis retained 39 variables in a discriminant function, and that function classified 82.5% of the respondents correctly as viewers or nonviewers (see Table 1).

Table 1 About Here

A discriminant function with 39 variables is not very parsimonious, however. It seemed likely that a simpler equation might be almost as efficient in classifying respondents. To investigate this possibility, the 11 "best" predictor variables from the first discriminant analysis were selected for a second discriminant analysis. The 11 were selected on the basis of the significance of the change in Rao's V contributed by each variable. The 11

variables were those which had contributed a change in Rao's V which was significant at the .05 level or better.

This second discriminant analysis retained all 11 variables and produced a function which classified 74.6% of the respondents correctly (see Table 2).

Table 2 About Here

The standardized discriminant function coefficients for the eleven-variable analysis are presented in Table 3. The larger the coefficient, the more important that variable is in the discriminant function.

Table 3 About Here

These standardized coefficients indicate that nonviewing is associated with: (1) Less satisfaction from family life, (2) Greater happiness with things in general, (3) Fewer number of children under age 6 in the household, (4) Greater number of memberships in groups and organizations, (5) Greater time spent in active military service, (6) Lower family income, (7) Stronger view of self as being religious, (8) Greater numbers of teenagers (age 13-17) in household, (9) Higher level of family income when person was 16, (10) Less frequent attendance at religious services, and (11) More frequent socializing with friends outside the neighborhood.

A discriminant score for each respondent can be computed either by using the standardized coefficients and standardized scores on all 11 variables or by using the unstandardized coefficients and raw scores for all 11 variables.

In this analysis, a positive discriminant score means a respondent is classified as a nonviewer. Discriminant scores based on the eleven-variable function for the 114 cases are shown in back-to-back stem-and-leaf displays in Table 4. A stem-and-leaf display is a method of presenting data developed by Tukey.[17] A stem-and-leaf display falls somewhere in between a conventional table and a conventional graph. It has a meaningful shape that can be examined much like a regular histogram, except that it is turned on its side. At the same time, the original scores are preserved in more detail than they are in a histogram. In Table 4, the first line records a score of -3.0 for a viewer by using a stem of -3. and a leaf of 0. The second line records two scores for viewers of -2.6 and -2.9 by using a stem of -2. and leaves of 6 and 9. Putting the stem-and-leaf displays for viewers and nonviewers back-to-back shows that the viewers tend to have negative discriminant scores and the nonviewers tend to have positive discriminant scores, although there is some overlap. The 14 viewers with discriminant scores greater than 0 are misclassified by the function as nonviewers, and the 15 nonviewers with discriminant scores less than 0 are misclassified as viewers.

Table 4 About Here

A closer look at the two respondents with the most extreme scores might help to clarify the pictures of a viewer and a nonviewer. Even these respondents do not have "typical" scores for viewers or nonviewers on all variables, however.

The respondent with a discriminant score of -3.0 -- the most extreme score in the direction of viewing -- had the following characteristics. He (or she) was very satisfied with family life, was pretty happy with things in general, had one person under 6 in the household, had membership in only one organization, had no time in active military service, had a family income of $10,000-$14,999, felt a "not very strong" religious preference, had no household members of 13-17 years, had a below average family income at age 16, attended religious services several times a year and spent social evenings with friends outside the neighborhood several times a year.

The respondent with a discriminant score of 2.6 -- the most extreme score in the direction of nonviewing -- had the following characteristics. He (or she) was very satisfied with family life, was very happy with things in general, had no persons under 6 in the household, had membership in six organizations, had no time in active military service, had a family income of $25,000 or more, felt a "strong" religious preference, had two household members of 13-17 years, had an above average family income at age 16, attended religious services about once a month and spent social evenings with friends outside the neighborhood once or twice a week.

The final test of a discriminant function is whether or not it can be used to classify cases correctly with a new data set other than the set upon which it was developed. To make this test, the eleven-variable discriminant function that was developed on the NORC 1975 General Social Survey was used to classify a sample from the NORC 1977 General Social Survey. This sample consisted of all 61 nonviewers and a random sample of 61 viewers. The discriminant function correctly classified 66.4% of the cases in this sample (see Table 5).

Table 5 About Here

Discussion

This study developed an eleven-variable discriminant function that succeeded in classifying television viewers and nonviewers correctly for 74.6% of the cases in a sample from a national survey. The function was also tested on an entirely different data set gathered two years later, and it succeeded in correct classification for 66.4% of the cases.

Some of the variables in the function, such as income and membership in organizations, had been found in earlier studies to be related to television non-ownership or nonviewing. Other variables in the function, such as satisfaction with family life and strength of religious preference, had not been examined in earlier studies.

This study was limited in developing a discriminant function to dealing with the variables that had been included in the NORC General Social Surveys. It seems likely that a study incorporating even more of the "life style pattern" variables recommended by Plummer might develop a discriminant function that classified viewers and nonviewers even more accurately.

The present research alone seems sufficient, however, to bring into question Jackson-Beeck's conclusion that "the most appropriate characterization of the television nonviewer thus appears to be none at all."

FOOTNOTES

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14 Fred N. Kerlinger and Elazar J. Pedhazur, Multiple Regression in Behavioral Research (New York: Holt, Rinehart and Winston, 1973), p. 337.

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16 Norman H. Nie, C. Hadlai Hull, Jean G. Jenkins, Karin Steinbrenner and Dale H. Bent, Statistical Package for the Social Sciences, 2nd Ed. (New York: McGraw-Hill, 1975).

17 John W. Tukey, Exploratory Data Analysis (Reading, Mass.: Addison-Wesley, 1977).

TABLE 1

Prediction Results for Discriminant Function Using 39 Variables

On 1975 NORC Data

	Predicted Group	
	Nonviewers	Viewers
Actual Group		
Nonviewers	47	10
Viewers	10	47

Chi-square = 48.035, $p < .0001$

TABLE 2

Prediction Results for Discriminant Function Using 11 Variables

On 1975 NORC Data

	Predicted Group	
	Nonviewers	Viewers
Actual Group		
Nonviewers	42	15
Viewers	14	43

Chi-square = 27.509, $p < .0001$

TABLE 3

Standardized Discriminant Function Coefficients

For Eleven-Variable Analysis

Satisfaction with family life (from 1 for a very great deal to 7 for none)	.96773*
General happiness (from 1 for very happy to 3 for not too happy)	-.52028
Number of members of household under 6 years old	-.36321
Number of groups or organizations belonged to	.60663
Time spent on active military duty (from 0 for no active duty to 3 for more than 4 years)	.50229
Family income (from 01 for under $1,000 to 12 for $25,000 or more)	-.48764
Strength of religion (from 1 for strong to 3 for not very strong)	-.58625
Number of household members 13 to 17 years old	.36577
Family income when respondent was 16 (from 1 for far below average to 5 for far above average)	.26288
Frequency of attending religious services (from 0 for never to 8 for several times a week)	-.30814
Frequency of spending a social evening with friends who live outside the neighborhood (from 1 for almost every day to 7 for never)	-.24467

*A positive coefficient means a high score on the variable is associated with nonviewing. A negative coefficient means a high score on the variable is associated with viewing.

TABLE 4

Back-to-Back Stem-and-Leaf Displays of Discriminant Scores

For Viewers and Nonviewers

Viewers		Nonviewers
0	-3.	
96	-2.	
	-2.	
9998887665	-1.	5
44443321110000	-1.	04
98887666555	-0.	699
44321	-0.	000111344
442221110	+0.	01233334
665	+0.	557788899
00	+1.	001133334
	+1.	6888999
	+2.	11334
	+2.	5556
	+3.	

TABLE 5

Prediction Results on Discriminant Function Using 11 Variables

On 1977 NORC Data

	Predicted Group	
	Nonviewers	Viewers
Actual Group		
Nonviewers	40	21
Viewers	20	41

Chi-square = 11.839, $p < .001$